

Brucellosis

Bioterrorism Agent Profiles for Health Care Workers

Causative Agent:

Brucellosis is a zoonotic disease caused by one of four species of bacteria:

- 1) *Brucella melitensis* 2) *Brucella abortus* 3) *Brucella suis* 4) *Brucella canis*.

It is a small, gram-negative aerobic coccobacillus that grows within monocytes and macrophages.

Routes of Exposure:

Humans can acquire brucellosis through the inhalation of contaminated aerosols, ingestion of raw or unpasteurized infected milk or meat, or if abraded skin or conjunctival surfaces come into contact with the bacteria. Domestic animals that serve as reservoirs for the bacteria are goats, cattle, sheep, pigs and camels. Specifically, cattle and goats can carry *B. melitensis*, cattle can carry *B. abortus*, pigs can serve as reservoirs for *B. suis*, and dogs can serve as a reservoir for *B. canis*.

Infective Dose & Infectivity:

10-100 organisms

Incubation Period:

The incubation period can range from 5-60 days with an average of 1-2 months.

Clinical Effects:

Brucellosis is a systemic infection characterized by an undulant fever pattern. It typically presents as an acute non-specific febrile illness with chills, sweats, headache, fatigue, myalgias, arthralgias, and anorexia. 15-25% of infected individuals will have cough. A normal chest radiograph is often present. Lymphadenopathy is present in 10-20% of patients, and 20-30% experience splenomegaly. Complications of brucellosis infection include: Sacroilitis, arthritis, vertebral osteomyelitis, epididymo-orchitis, and rarely, endocarditis. Routine labs are usually non-specific.

Laboratory testing:

If brucellosis is suspected, the diagnosis is usually made through acute and convalescent serology. However, the following guidelines for sample collection should be followed:

0-24 HRS: Nasal swabs, sputum, induced respiratory secretions for culture

24-72 HRS: Blood for culture

>6DAYS: Blood and tissue for culture

Additionally, the laboratory should be notified that brucellosis is suspected because of the high risk to laboratory workers due to transmissibility of the bacteria.

Lethality:

Brucellosis has a very low mortality rate, less than 5% of untreated cases, with most deaths caused by endocarditis or meningitis.

Transmissibility:

There is no evidence of person-to-person transmission of brucellosis.

Primary contaminations & Methods of Dissemination:

Likely methods of dissemination would either be through aerosolization or sabotage of food.

Decontamination & Isolation:

Patients can be managed using standard precautions; no isolation is required.

Treatment:

The recommended treatment for brucellosis is doxycycline 200 mg/day plus rifampin 900 mg/day for six weeks, or 200 mg/day of doxycycline for six weeks.

Prophylaxis:

For cases of accidental inoculation or exposure, doxycycline and rifampin have been used as post-exposure prophylaxis. No approved human brucella vaccine is available.

Differential Diagnosis:

Because the initial symptoms are non-specific, the differential diagnosis is broad and includes bacterial, viral and mycoplasmal infections. Brucellosis may be indistinguishable from typhoid fever, or the typhoidal form of tularemia.

References:

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